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10/517,628

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EXAMINER

JACOBSON, MICHELE LYNN

ART UNIT

PAPER NUMBER

1794

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|-------------------------------------------|--|
| Office Action Summary | Application No. 10/517,628 | Applicant(s) FLACONNECHE ET AL. | |
| | Examiner MICHELE JACOBSON | Art Unit 1794 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/18/08 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 14 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 14 recites the limitation that "said fillers are present in a minimum amount to

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adsorb and trap *all* of the hydrocarbons calculated to be released through the polymer material alone for the duration of the life of the structure”.(emphasis added) Adsorption is an equilibrium process. It would be impossible for the mineral filler materials recited to adsorb *all* of the hydrocarbons released through the polymer material alone.

Therefore applicant’s recitation that the mineral material adsorb all of the hydrocarbons released is not enabled.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claims 1-14 are indefinite for claiming the invention in terms of physical properties rather than the chemical or structural features that produce said properties. *Ex parte Slob*, 157 USPQ 172, states, “Claims merely setting forth physical characteristics desired in an article, and not setting forth specific composition which would meet such characteristics, are invalid as vague, indefinite, and functional since they cover any conceivable combination of ingredients either presently existing or which might be discovered in the future and which would impart said desired characteristics.” Also, “it is necessary that the product be described with sufficient particularity that it can be identified so that one can determine what will and will not infringe.” *Benger Labs, Ltd v. R.K. Laros Co.*, 135 USPQ 11, *In re Bridgeford* 149 USPQ 55, *Locklin et al. v. Switzer*

Bros., Inc., 131 USPQ 294. Furthermore, “Reciting the physical and chemical characteristics of the claimed product will not suffice where it is not certain that a sufficient number of characteristics have been recited that the claim reads only on the particular compound which applicant has invented.” *Ex parte Siddiqui*, 156 USPQ 426, *Ex parte Davission et al.*, 133 USPQ 400, *Ex parte Fox*, 128 USPQ 157.

7. In the instant case, claim 1, from which all the other claims depend, recites the limitation “said fillers are present in an amount to reduce permeability of said structure calculated from the permeability of the polymer material alone and from the amount of hydrocarbons released through the polymer material for the duration of the life of the structure”. This limitation is indefinite because it does not specify by what amount the permeability of the structure is to be reduced, and therefore a calculation of the amount of filler necessary cannot be undertaken. Additionally, it is also impossible to determine what the “duration of the life of the structure” would be since what material the structure is intended to be made of is not specified aside from reciting a “polymer”, no indication is given for the thickness of the walls of the structure, and no indication of the physical dimensions of the structure is given other than it be capable of containing hydrocarbons. Since there is no indication what the duration of the life of the structure would be, one of ordinary skill would not be reasonably expected to be capable of determining the amount of hydrocarbons released through the polymer material for the duration of the life of the structure”. Since it appears applicant intends to recite at least that the permeability of the structure is decreased by the addition of mineral fillers for the purpose of examination claim 1 will be interpreted to encompass this limitation.

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8. Claim 14 is indefinite for the recitation that “said fillers are present in a minimum amount to adsorb and trap all of the hydrocarbons calculated to be released through the polymer material alone for the duration of the life of the structure”. If the permeability of the structure is decreased by the addition of mineral materials, it would not be necessary for the mineral material to adsorb the amount of hydrocarbons expected to be released from a structure made from the polymer material alone. Additionally, for the reasons stated above, it would be impossible for one of ordinary skill to be reasonably apprised of the duration of the life of the structure since polymer materials are not specified. For the purpose of examination the examiner will interpret the limitations of claim 14 to indicate that amount of filler has been optimized.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1, 3, 4 and 6-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Ellis European Patent Number EP 1108598A2 (hereafter referred to as Ellis) with evidence provided by Ellis U.S. Patent Application Publication No. 2003/0049398.

11. Ellis teaches a permeation barrier fuel tank with an inner layer, middle nanocomposite polymer layer and an outer layer. (Para. 7) The nanocomposite middle

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layer is recited to be comprised of polyamide or ethylene vinyl alcohol copolymer in which platy filler material has been uniformly dispersed. The platy filler material is recited to have particles with a high aspect ratio of about 200 to about 1000 where the thickness is on the order of one nanometer. (Para. 14) The presence of the platy filler material presents an efficient obstacle to the transport i.e. diffusion of penetrant molecules such as those normally found in fuels. (Para. 16) The barrier layer of the invention can be molded according to existing thermoforming methods such as extrusion, lamination etc. that are currently used for existing fuel tanks.

12. Ellis clearly anticipates the composition and fuel tank comprised of a polyamide layer with nanometric material (Ellis: platy filler material) dispersed therein produced by extrusion recited in claims 1, 3, 4 and 6-9. It is well known in the adsorbent art that platy material is synonymous with mineral materials as evidenced by Ellis U.S. Patent Application Publication No. 2003/0049398 where it is recited that "nanofiller" (also referred to as platy fillers) refers to these nanoscale constituents. A nanofiller generally comprises a filler material having a major diameter less than or equal to about 100 nanometers. Nanofillers are generally present in an amount of about 1 wt % to about 50 wt %, weight percent based on the total weight of a nanocomposite. Additionally, nanofillers generally have a surface area to thickness aspect ratio of about 50 to about 1,000. Common sources of nanofillers for polymers are found as naturally occurring smectite clays or layered silicates such as montmorillonite. Man-made nanofillers, such as synthetic mica are also available". (Para. 3) The platy nanofiller materials recited by Ellis are understood in the art to be comprised of mineral materials such as clays and

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silicates. Therefore, Ellis anticipates the limitation of a mineral filler set forth in claim 1. Since Ellis specifically recites that the platy material used is nano-scale in size, the nanometric type permeability reducing filler recited in claim 4 is anticipated.

13. Regarding claims 6 and 7: Claim 6 recites the limitation “wherein at least one face of is treated ... to reduce the permeability”. It is the examiner’s opinion that adding platy nanomaterial to the polyamide of the barrier layer of Ellis is interpreted as treating the barrier layer to reduce permeability. Ellis therefore anticipates the limitations set forth in claim 6. Ellis clearly recites extrusion as a fabrication method as set forth in claim 7.

14. Regarding claim 8: Ellis clearly anticipates the application of the composite barrier material for fuel tank applications.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 5, 9, 10, 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ellis European Patent Number EP 1108598A2 (hereafter referred to as Ellis).

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17. Ellis is silent regarding disposing an additional layer between the inner layer and the permeation barrier layer and the use of the laminate recited for a fuel line.

18. Regarding claim 5: It is well known in the fuel tank art to utilize additional polymer layers in order to increase the structural rigidity of fuel tanks. It would have been obvious to one having ordinary skill in the art at the time the invention was made who desired a more rigid or thick structure to dispose an additional layer between the inner layer and the permeation barrier layer of the invention as disclosed in Ellis. The disposal of such a layer in the tank of Ellis would have produced the invention as claimed in claim 5.

19. Regarding claim 9: The examiner takes official notice that it is well known in the fuel containment art that structures that provide suitable barriers for fuel tanks would also provide suitable barriers for fuel lines. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the laminate structure recited by Ellis to fashion a fuel line. This obvious utilization of the structure of Ellis would have produced the invention as claimed in claim 9.

20. Regarding claims 10 and 12: Although Ellis recites that the platy material be dispersed in a layer of EVOH or polyamide, Ellis also recites that the outer layer of the fuel tank be comprised of polyethylene. It would have been obvious to one having ordinary skill in the art at the time the invention was made who desired to increase the barrier property of the external polyethylene layer to have added platy material to it as well, thus increasing the overall barrier properties of the fuel tank recited. This obvious modification would have produced a fuel tank with an inner polyethylene layer, a middle

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layer comprising EVOH or polyamide, and an outer layer comprising polyethylene and platy mineral material. This structure would have been the same as the invention as claimed in claims 10 and 12.

21. Regarding claim 14: It would have been obvious to optimize the amount of filler added in order to gain a desired reduction in permeability by using the least amount of filler material in order to reduce costs of the motor vehicle tank recited by Ellis. This obvious optimization would have produced the invention as claimed in claim 14.

22. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ellis European Patent Number EP 1108598A2 (hereafter referred to as Ellis) as evidenced by Faulkner U.S. Patent No. 6,538,069 (hereafter referred to as Faulkner).

23. Ellis is silent regarding the platy nanomaterial recited being composed of talc, metal particles or clay.

24. Faulkner teaches a low permeability polymer compound. Faulkner provides evidence that it is well known in the polymer art that the term platy filler used to accomplish low permeability compositions is recognized to mean mineral materials such mica, talc or clay. (Col. 3, lines 9-12)

25. Both Faulkner and Ellis are directed towards polymer compositions with low permeability. As evidenced by Faulkner, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized talc or clay particles as the platy nanomaterials described by Ellis since these materials were well known to be platy nanomaterials capable of decreasing the permeability of polymer compositions.

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The use of these materials in the invention of Ellis would have produced the invention as claimed in claim 11.

26. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ellis European Patent Number EP 1108598A2 (hereafter referred to as Ellis) and Distelhoff et al. U.S. Patent Application Publication No. 2002/0047015 (hereafter referred to as Distelhoff).

27. Ellis teaches as has been recited above but is silent regarding the addition of zeolite, activated charcoal, carbon nanotubes or mixtures thereof to the permeation barrier layer recited.

28. Distelhoff teaches a double walled fuel tank comprising a filter for removing fuel vapors from the gap disposed between the walls of the tank. (Para. 6) The utility of activated charcoal for the purpose of removing fuel vapors is specifically recited. (Para. 13)

29. Both Ellis and Distelhoff are directed towards prevention of hydrocarbon vapors from entering the environment. The motivation to combine Distelhoff with Ellis would have been to further reduce the amount of hydrocarbon vapors escaping from the tank of the permeability reducing structure of Ellis by the incorporation of additional adsorbent material into the permeability reducing layer.

30. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have added activated charcoal (which is inherently a micro- or nanoscale material) to the platy nanomaterial filled layer of Ellis in order to further

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increase the barrier properties of the layer. This obvious improvement to the invention of Ellis would have produced the invention as claimed in claim 2.

31. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ellis European Patent Number EP 1108598A2 (hereafter referred to as Ellis) and Coughlin et al. U.S. Patent No. 5,508,330 (hereafter referred to as Coughlin).

32. Ellis teaches what has been recited above but is silent regarding the fluorination of the interior surface of the tank.

33. Coughlin teaches that "Patented processes are known whereby the inner surface of plastic containers are modified by sulfonation or fluorination during or after the blow molding of the container. This treatment changes the surface characteristics of the polyolefin used to make the container so that the solvent is kept from wetting the inner surface. This prevents absorption and transmission of the solvent vapor through the container wall. The polyolefin is thus a barrier to either nonpolar solvents or aqueous solutions of active ingredient. Such containers can be used for herbicides, pesticides, gasoline, and other products that would normally penetrate polyolefin and would frequently be packaged in glass or metal."

34. Both Coughlin and Ellis are directed towards the improvement in barrier properties of molded articles. As recited by Coughlin, it was well known in the barrier material art at the time the invention was made to perform fluorination on the inside of containers means for holding gasoline. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have performed

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fluorination on the inside of the container recited by Ellis in order to further increase the barrier properties of the fuel tank. This obvious improvement to the invention of Ellis would have produced the invention claimed in claim 13.

Response to Arguments

35. Applicant's arguments filed 11/18/08 have been fully considered but they are not persuasive.

36. Applicant asserts on page 6 of the remarks that because Ellis recites that the platy filler material "presents an efficient obstacle to the transport, i.e. diffusion, of penetrant molecules" that the platy materials recited by Ellis do not adsorb hydrocarbons. However, it is well known that nano-fillers such as smectite clays or montmorillonite adsorb hydrocarbons in addition to whatever obstacle to transport was specifically disclosed by Ellis. (See for example, Cheng and Huang, Organic Geochemistry, vol. 35, 2004, p. 413-423) As such, applicant arguments negating the adsorptive properties of platy filler materials are not found persuasive.

37. Applicant's assertions regarding the calculation of the amount of mineral filler added to the structure claimed being distinguishable from the amount of material recited to be added by Ellis stated on page 7 of the remarks are not found persuasive, since as stated above, applicant's description of this calculation in claim 1 is indefinite and would be impossible for one of ordinary skill in the art to reasonably undertake.

38. Applicant's arguments regarding Sikdar on pages 7 and 8 of the remarks are moot due to the new grounds of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHELE JACOBSON whose telephone number is (571)272-8905. The examiner can normally be reached on Monday-Thursday 8:30 AM-7 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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